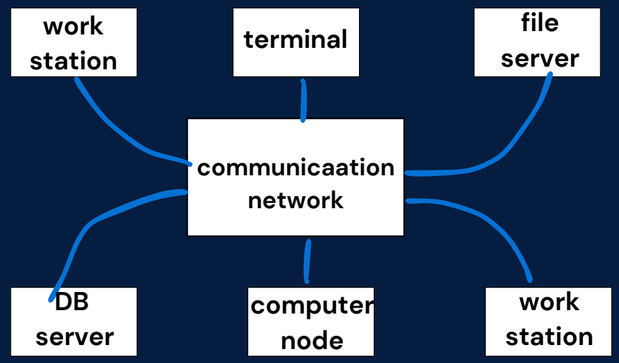
Distributed Operating System



A **Distributed OS** manages a group of networked computers, allowing them to function as a single system. Multiple computers work together but are not directly connected.

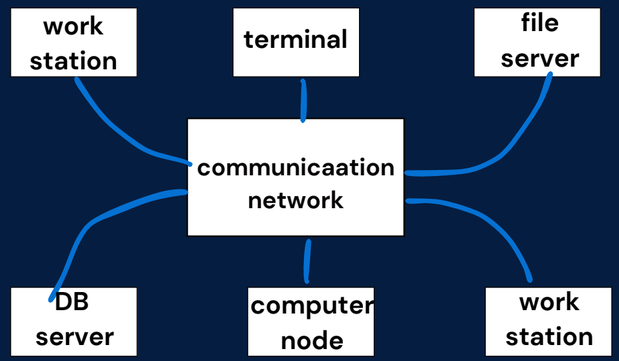
A Distributed OS is like a team of remote workers who collaborate online. Each worker has their own laptop and internet connection, but they share tasks and work together to complete a big project. Even if one worker faces internet issues, the others can continue working without stopping the project.

It enables more powerful and reliable systems by connecting many computers together, useful in handling big tasks like running websites or processing huge amounts of data.

How it works:

- The OS makes sure that all computers (or nodes) in the network are synchronized.
- It can spread tasks across the computers, improving speed and reliability

Distributed Operating System



For ex :

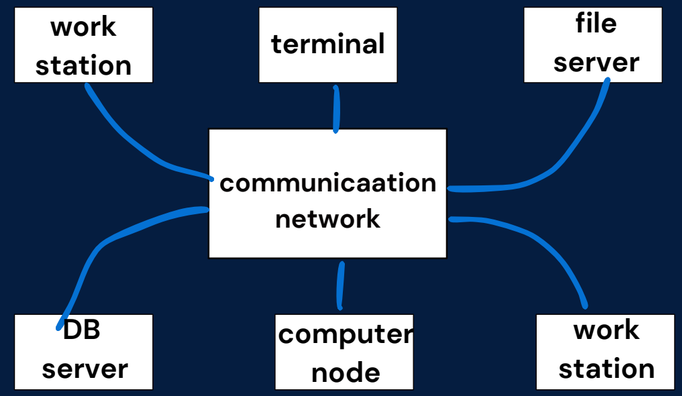
- Google Search – When you search something on Google, multiple computers (servers) across the world work together to find the best results and show them quickly.
- Netflix Streaming – When you watch a movie on Netflix, different servers in different locations help deliver the video smoothly based on your internet speed.

Note : Distributed OS connects multiple computers and makes them work as a single unit, but each has its own resources (CPU, storage, etc.).

Distributed Operating System

Types of Distributed OS

- Client-Server Distributed OS
- Peer-to-Peer (P2P) Distributed OS
- Cluster Computing Distributed OS
- Grid Computing Distributed OS
- Cloud-Based Distributed OS

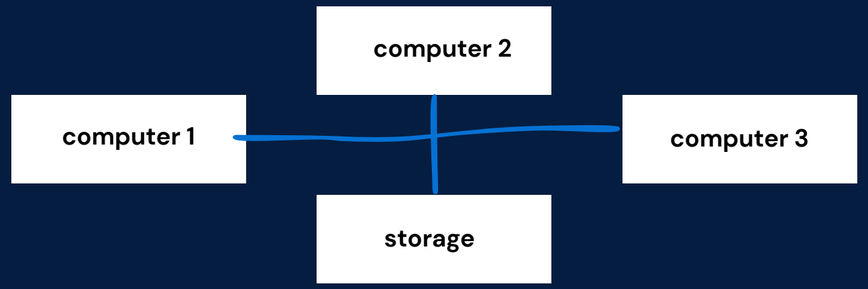


Client-Server Distributed OS

In the diagram

1. Communication Network – Connects all devices.
2. Workstation – User interacts with applications.
3. Database Server – Stores and processes data.
4. Terminal – Provides user access to the system.

Clustered Operating System



A **Clustered OS** is similar to distributed OS, but more focused on providing high availability and better performance by connecting multiple computers (clusters). It is great for systems that require high uptime, like in hospitals, banks, or large websites.

A Clustered OS is like a restaurant kitchen where multiple chefs work together. They share the same ingredients (storage) and tools (computing resources). If one chef gets sick, the others can still continue cooking to keep the restaurant running smoothly.

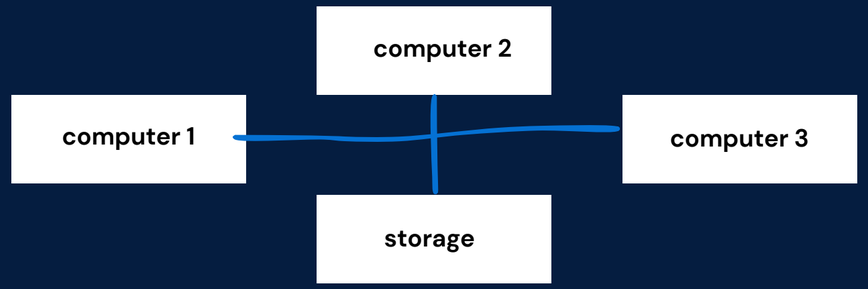
How it works:

- These computers are connected so if one fails,

the others can take over, making sure the system continues to run smoothly.

- Often used for data-heavy or mission-critical applications.e

Clustered Operating System



For ex : Linux clusters used for high-performance computing or large databases.

- Bank Servers – Banks use clustered OS so that if one server handling transactions fails, another server immediately takes over to ensure customers can still withdraw or transfer money.
- Online Gaming Servers – Games like PUBG or Call of Duty use clustered servers to make sure if one game server crashes, another can take over without kicking players out.

Note : Clustered OS connects multiple computers that share a common storage system, ensuring high availability and reliability.

Difference between Distributed and Clustered Operating System

Feature	Distributed OS (Like a Remote Work Team)	Clustered OS (Like a Restaurant Kitchen)
How it works?	Multiple computers work together but are not directly connected.	Multiple computers are connected and share storage/resources.
What happens if one fails?	Others continue working without major issues.	Another system in the cluster takes over immediately.
Best for?	Large-scale applications like Google, Netflix, AWS.	High-reliability tasks like banking, gaming, enterprise servers.